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EXCESSIVE INFANT MORTALITY: AN EXPLORATION OF FACTORS CONTRIBUTING TO SOUTH DAKOTA INDIANS' LIFE CHANCES

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#### Introduction

The consequences of racial inequality are clearly delineated in an analysis of social indicators between racial groups. Among the more direct indicators of social inequality are infant and general mortality rates (Anderson, 1973:286). Indeed, "no cold statistic expresses more eloquently the difference between a society of sufficiency and a society of deprivation than the infant mortality rate" (Newland, 1981:5). Societies of deprivation that produce higher rates of infant mortality are characterized by low levels of education (Bertoli at al., 1984; Hecht and Cutright, 1979), poor health care (Gortmaker, 1979), lower socioeconomic status (Fordyce, 1977), and other problematic environmental conditions.

South Dakota is characterized by racial differences in infant mortality rates. Are these rates significantly different? If so, can the social conditions that are associated with high and low rates be distinguished? These are the general questions addressed by this research. Specifically, this research compares and contrasts pertinent vital statistics of the Native American population in South Dakota with the White population. The nature of differential life chances will also be examined.

The issue of infant mortality in the United States has gained increased notoriety in recent years. This increased attention is due to two factors. The first deals with the realization that the infant mortality rate in the United States is loosing ground when compared with other countries. The United States' ranking among industrialized nations, in terms of infant mortality, has been consistently falling and has in fact dropped out of the top twenty lowest ratings in the world (Weeks, 1989: 170). Research has further demonstrated that in countries such as the United States, which contain heterogenous populations, certain groups exhibit significantly higher rates of infant mortality than others (Fordyce, 1977; Bertoli et al., 1984; Shin, 1975; Johnson, 1987).

The second reason for increased attention is the realization that the discrepancy among infant mortality rates among races still exists and in some cases is increasing. For instance, in 1930, the infant mortality rate (number of deaths for infants one year of age or less per thousand live births), was 84.8 for all races. In this same year the rate was 60.2 for Whites and 98.4 for Nonwhites. By 1980, the infant mortality rate for all populations had declined to 11.0 per thousand, but discrepancies still existed. The rate for Whites was 9.3 per thousand, while the rate for Black infants was 18.9. The infant mortality rate for Indians for this same period was 13.3 per thousand. So in 1980, Black infants were more than twice as likely than White infants to die in the first

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year of life. Indeed, the relative racial difference in infant mortality had actually increased over time suggesting a greater disparity in negative factors associated with infant survival (Johnson, 1987: 228). What is the nature of these discrepancies in South Dakota? Are these discrepancies statistically significant? In terms of infant mortality, do American Indians in South Dakota have lower life chances than whites? This research looks for answers to these questions.

#### NATIVE AMERICANS AS A MINORITY GROUP

Much of the literature pertaining to inequality, social stratification, poverty, and death rates use Black Americans as a main comparative group (Shin, 1975; Fordyce, 1977; Hecht and Cutright, 1979). This is due mainly to the fact that Blacks are the largest racial group in the United States. However, other minority groups, such as Native Americans, have unique and sometimes greater problems related to social inequality (Bertoli et al., 1984). These issues are often lost when minority groups are viewed as homogenous.

As indicated, infant mortality rates in the United States are not the same for all racial groups, nor are they the same for subgroups within the same racial population. For instance, infant mortality among Indians varies dramatically depending upon the Indian Health Service Area in which an individual resides. According to the U.S. Congress, Office of Technology Assessment (1986), the infant mortality rate among the twelve Indian Health Service areas for 1981 varied from a low of 8.9 per thousand for the Oklahoma City area to a high of 21.9 per thousand for the Aberdeen area. South Dakota is within the Aberdeen area.

Generally speaking, the infant mortality rate among Indians in South Dakota is deplorable. While the infant mortality rate for Whites in South Dakota is among the lowest in the nation, the rate for Indians is extremely high, even when compared with other minority groups. Tables One, Two, and Three profile the racial differences in the infant mortality rates for South Dakota from 1977 to 1987. Table One represents the general infant mortality rates. Table Two represents the neonatal infant mortality rates. Finally, Table Three represents the postneonatal infant mortality rates for Whites were 7.9 per thousand and figures show that infant mortality rates for Whites were 4.6 per thousand and 7.6 for Indians. Postneonatal rate was 3.3 per thousand births for Whites and 13.6 for Indians.

The most pronounced differences in infant deaths are revealed in an examination of postneonatal death rates. Neonatal death rates (birth to under 28 days) are due to congenital and other factors present prior to birth, while postneonatal deaths are influenced by environmental characteristics which act after the child has been born (Gortmaker, 1979). The disparity between postneonatal mortality rates indicates a need to investigate the factors which are associated with these mortality patterns. Though the literature (Bertoli et al., 1984) notes that Indian reservations produce social conditions from which higher rates of postneonatal death emerge, little research in this area has been done. South Dakota provides a good example of the potential variations in health status which can exist from one county to the next or from one social group to another.

#### SOCIAL CONTEXT OF AMERICAN INDIANS IN SOUTH DAKOTA

In order to understand the present Native American situation as it relates to social inequality and life chances, it is important to focus on the appropriate historical and social structural context. It should be remembered that the Native American population is a "conquered" people. The process of the western expansion and concomitant movement of White settlers to Indian lands led to governmental legislation that shaped the demise of the chosen lifestyle and freedom of the "original" Americans. Through a combination of government legislation and the process of land settlement, many Indians were relocated on reservations in the western United States. South Dakota has nine reservations and Indian communities.

The U.S. government, in exchange for the land they appropriated from the Indian people, promised to provide for their social welfare. However, for most Indians the relocation policy isolated them from society and created a system of dependence upon the government. Out of this policy emerged many problematic social conditions and negative stereotypes which have served to perpetuate discrimination against Indians. The result has been generalized poverty, unemployment, educational failure, alienation, low morale, and heavy alcohol abuse (Dworkin, 1982: 233). On South Dakota reservations, up to 58 percent of families live in poverty, unemployment rates of 60 to 60 percent exist, and high school drop out rates are as high as 60 percent (Arwood, Baer, and Spencer, 1987; Baer and Bennett, 1987). These statistics demonstrate the impoverished social and economic conditions on South Dakota reservations.

## INDIAN HEALTH: AN ANALYSIS OF THE DATA

There are a multitude of factors influencing when and how death occurs. These factors are important tools in measuring the quality of life of a group. A higher death rate among a particular group, such as Indians, indicates the existence of unique social and health problems. For example, when death occurs earlier than average and with a greater degree of frequency, it is important to determine which social conditions specific to that population account for lower levels of health. This can be accomplished by analyzing the factors associated with morbidity and general mortality, age-specific mortality, and infant mortality.

#### MORBIDITY AND GENERAL MORTALITY

Higher numbers of Indian deaths are associated with the age structure and the prevalence of negative social and economic conditions. Indeed, the causes of death among American Indians in South Dakota are associated with a young population and social conditions that produce higher rates of accidents, alcohol abuse, and infant deaths with unknown causes.

If one examines the mortality figures for South Dakota as they appear in vital statistics records, the impression would be that Indians have a lower mortality rate than Whites. However, when differences in age composition are controlled for, South Dakota mortality rates for Whites are lower than the Native American population in every age category. This is due to the fact that the median age of the South Dakota Indian population is much younger (18.3) than the state median age (28.9) and, thus, only "appears" to have a lower death rate (Baer and Bennett, 1987). An older population would experience more deaths.

Bennett, 1987). An older population would experience more deaths. The causes of death for Indians, then, are more likely to be associated with those of a young population. This is apparent once actual percentages are compared by race. According to the Indian Health Service, in a three year period centered around 1981, 37 percent of Indian deaths occured in Indians younger than 45 years compared with only 12 percent of Americans of all races

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for the same age category (Office of Technology Assessment, 1986). As a consequence, Indian life expectancy is about ten years less than Whites. In summary, the standardized age-adjusted death rates for Whites is 9.3 and 15.9 for Indians (DeWitt, 1989).

The Indian Health Service also notes that the accident mortality rate among Indians is 3.4 times that of the general population. Deaths attributed to social and economic conditions predominate. For example, reasons for the high number of motor vehicle deaths are related to things such as long distances between destinations, poor roads, overcrowded and unsafe vehicles, and driving under the influence of alcohol. The prevalence of alcohol abuse is indicated by the high rates of liver disease and cirrhosis evident in the Indian population. In the Aberdeen Indian Health Service coverage area, deaths from cirrhosis and liver disease are 7.1 times the national average (Office of Technology Assessment, 1986).

Alcohol abuse and Sudden Infant Death Syndrome (S.I.D.S.) are often labeled as causes of infant deaths. In reality, alcohol abuse, like S.I.D.S., may be a symptom of social and economic problems, not a cause. Alcohol abuse must be considered a mitigating factor in many Indian deaths and illnesses. Alcohol has been found to be a contributory factor in accidents, suicide, homicide, diabetes, pneumonia, heart disease, cancer and birth defects (Office of Technology Assessment, 1986). Alcohol abuse is an area where changes can be made if the social correlates are addressed.

Suddent Infant Death Syndrome is an important factor in the overall issue of infant mortality. In 1985, 39.3 percent of White infant deaths occurred in the postneonatal period. This figure for Indian infants was 65.5 percent! Of the deaths occurring in the postneonatal period (28 days to 1 year), 18 out of 35 Whites fall into the S.I.D.S. category as do 8 of 19 Indian infants. This means that 51 percent of White infant deaths and 44 percent of Indian infant deaths between the ages of 28 days and 12 months occur in a category lacking clear definitions to indicate the actual cause of death among infants. Another measure of a group's overall health and life chances is the rate of mortality among different age cohorts, especially death rates among infants. The next section of this paper deals with the characteristics, causes, and implications of infant mortality.

#### INFANT MORTALITY

High infant mortality rates within the Indian community occur primarily among infants between the ages of 28 days and one year (postneonatal). This indicates that serious problems occur within this age group after they go home from the hospital. The Aberdeen Indian Health Service area has the highest infant mortality rate among Native Americans in the United States. These rates are almost twice the infant mortality rate of all ethnic minorities in the U.S. with 2.7 per 1,000 births. Most disconcerting is the fact that South Dakota has had the <u>lowest</u> infant mortality rate in the United States among Whites and the <u>highest</u> among non-whites. This trend is found to be consistent over time.

When analyzing South Dakota counties with a high proportion of Native American population, interesting patterns are evident. For example, Shannon County in South Dakota is comprised of approximately 93 percent Indians and contains 23 percent of the total Indian population of the state. The Pine Ridge Indian Reservation is located in Shannon County. It is revealing to note that 40 percent of Indian neonatal and 53 percent of the postneonatal deaths in the state in 1985 occurred in Shannon County. Fully 50 percent of the Indian infant deaths took place among only 23 percent of the population. In addition, 11.9 percent of all infant deaths (White and Non-whites) in South Dakota occur among

only 1.5 percent of the population (Indians in Shannon County). Finally, in Shannon County the infant mortality rate was 36:1 per 1,000 in 1985, which is four times the rate for Whites in the state and over twice the average infant mortality rate among all Indians (DeWitt, 1989).

The higher rates among counties with large Indian populations also vary positively with several social indicators. These social indicators indicate the overall quality of life which exist. Analysis of prior research and literature identified the following social indicators to be associated with infant mortality: education, poverty, median income, percent Indian population, female-headed households, housing-units lacking complete plumbing, divorce rate, deaths from liver disease and physician density, the percentage of families living in poverty.

## QUALITY OF LIFE AND NATIVE AMERICANS IN SOUTH DAKOTA

Pearson correlation coefficients were used to test whether quality of life variables are associated with the percentage of the county population that is Indian (see Table 4). The following relationships were found to exist (DeWitt, 1989):

- 1. There is an inverse relationship between the percentage of Indians in a county and the percentage of individuals over 25 who have graduated from high school.
- 2. There is a strong positive correlation (.70) between the percentage of Indians in a county and the percent of families living in poverty.
- 3. There is a negative correlation between the percentage of Indians living in a county and median family income.
- 4. There is a powerful (.92) positive correlation between the percentage of Indians and the percent of female-headed households with no husband present.
- 5. There is a strong-positive correlation (.78) between the percentage of Indians and the number of housing units lacking complete plumbing.
- 6. The correlation between the percentage of divorces and the percentage of Indians is significant (.56).
- 7. There is a significant positive association (.56) between the percentage of Indians and the death rate from liver disease.
- 8. No significant association between physician density and the percentage of Indians was found.

Results of Pearson's correlation tests demonstrates that Indians in South Dakota live in counties with poorer social conditions. The next section examines the relationship between the percentage of Indians and actual rates of infant mortality.

## INFANT MORTALITY RATES AND NATIVE AMERICANS IN SOUTH DAKOTA

A GLM least-squares means procedure (SAS Institute, Inc., 1988) was used to compare infant mortality rates with county groupings based upon proportion of Indians in the county. Table five profiles the findings with respect to the general, neonatal and postneonatal infant rates in South Dakota for the year 1980.

The county groups were divided into three categories for the purposes of statistical analysis. The groups appear in the table under the heading "C Type", the term county type. County type 1 is the group of counties in South Dakota which have a percentage of Indian population which is 25 percent or greater. County type 2 is the group with an Indian population of 6.7 to 24.99 percent. County type 3 is the group of counties with less than 6.7 percent

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Indians. As Table Five shows all mean rates of infant mortality are higher for county type 1. These are the counties that contain high percentages of Indians. The first section of table five profiles the data of the general infant mortality rates. The general infant mortality rate in 1980 for counties containing an Indian population of 25 percent or greater in South Dakota was approximately 2.5 times the rate exhibited by all other counties in the state.

The second section of Table Five contains data pertaining to the neonatal infant mortality rate. The neonatal infant mortality rate in 1980 for counties containing an Indian population of 25 percent or greater in South Dakota was approximately 2.7 times the rate found in all other counties in the state.

The third section of Table Five profiles the data pertaining to the postneonatal infant mortality rate. This rate in 1980 for counties containing an Indian population of 25 percent or greater was approximately 2.5 times the rate found in all other counties in the state.

At the .05 level of significance, the LS-Means tests show no significant differences between C-type 2 and C-type 3 in terms of general, neonatal, and postneonatal infant mortality rates. Nor are there statistical differences between C-type 1 and C-type 2 in terms of neonatal and postneonatal rates. In each case, however, there are statistically significant differences between C-type 1 and C-type 3 counties.

In sum, counties with the greatest percentage of American Indians have significantly higher infant mortality rates than counties with the lowest percentage of Indians. Furthermore, interpretation of correlation tests implies that these higher rates among C-type 1 counties are associated with abject social conditions.

#### INFANT MORTALITY: IMPLICATIONS AND CONCLUSIONS

The results of this study indicate a continued consistent gap in health and mortality indicators between American Indian and White populations in South Dakota. Given these figures, many infant and young Indians find themselves at a distinct disadvantage in terms of life chances. Overall, the picture for Indians in South Dakota, especially in terms of social conditions on reservations require more attention. Foverty, alcohol abuse, poor prenatal and postneonatal health care, out-of-wedlock births and other social problems exacerbate the inherent problems of living on the reservation. Even with recent improvements, the rates of infant mortality, alcohol, murder, and accidental death remain dramatically high.

Finally, the young, growing Indian population is at risk. Issues must be addressed concerning prenatal and postnatal care. At present, both the internal and external bureaucracies governing Indian programs and resource allocation are so stagnated in red tape that they often inhibit rather than facilitate progress in the Indian community. The tribes and local, state, and federal governments must develop a vision of what quality of life should be and set in motion the appropriate measures needed to ensure a higher standard of living for those who find themselves in positions of dependency and dire need. Unfortunately, the failure to act swiftly results in a continuation of human suffering and, in extreme cases, death.

At the macro level, specific factors are related to changes in mortality in general and infant mortality in specific. Economic development has been recognized as a critical process in the provision of improved quality of life and reduction of deaths. Increases in income and education, improved, diversified and stable food supplies, as well as technological advances in medicine and health are among the identified factors. However, economic factors have had less direct effect on declines of deaths among the disadvantaged and low income

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populations of the country and the state. While economic development had a direct effect on the more elite elements of society, the benefits have not been distributed evenly across the total population.

Hence, as is the case in South Dakota, the pockets of underdevelopement characterized by high rates of poverty, lower educational attainment, high unemployment also are characterized with high mortality and high infant mortality.

The solutions remain clearly defined. Improve living conditions, work opportunities, health care and education and mortality rates should improve. The issue for planners and policy makers is to analyze the existing system and determine why the Indian babies die at two and three times the rates of White babies in the state of South Dakota. In addition, a priority for change must be targeted regarding the fact that nine of the nation's poorest counties are in South Dakota and eight of those are on or near Indian reservations in the state (The Lakota Times, February 10, 1988: 3). We must determine how to best implement the critical delivery of the "basic quality of life" services to all the population. This must be given top priority if the state is to achieve improvements in Indian infant mortality rates in the near future.

Development projects must deal with the Native American society and with social conditions that have been neglected by Whites and Native Americans alike for years. Developers must plan for a very young population, large households, a large percent of families headed by a single parent, low educational attainments, and low median family incomes.

Project leaders can not take for granted that certain human resources, skills and abilities designed to attack these problems already exist. A development project on a reservation that is merely "economic" will probably fail. What has to be built in is a human resource development component.

This component has three options. First is rehabilitation. Increasing personal skills and improving the local infrastructure---sewage and water systems, roads, bridges, and hospitals--are critical to human resource development.

Second are activities which prevent negative economic conditions, including minimum wage laws, improved education for the young, or relocating people to jobs.

Third is a "safety net". Traditional federal programs, such as foodstamps/ commodities, Aid to Dependent Children, General Assistance, HUD, CETA, and other programs have helped but they have not altered the basic economy. These programs alone have never raised the standard of living in any part of the country.

In sum, scaled industrialization, the development of mainstreet economies on the reservations, diversification, relevant training and education, and the support of strong family ties will be an effective economic development package program for South Dakota reservations. The high infant mortality rates that are characteristic of South Dakota Indian reservations will fall once social conditions are improved.

INFANT DEATH RATES BY RACE 1977-1987



SOURCE: SD DEPARTMENT of HEALTH 1988: 40

Table Two



NEONATAL DEATH RATES, BY RACE 1977-1987 (RATES PER 1000 LIVE BIRTHS)

SOURCE: SD DEPARTMENT of HEALTH 1988: 41

 Table Three

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 POSTNEONATAL DEATH RATES BY RACE, 1970-1987

 (RATES PER 1000 LIVE BIRTHS)



Table 4.	Pearson's Correlation Coefficients of Social Indicators and Proportion
	of Indian Population-Analysis of South Dakota Counties.

Social Indicator	% Indians in County	
% high school graduates	30*	_
% of families in poverty	.70*	
Median family income	35*	
% families w/female head	.92*	
Number of households lacking complete plumbing	.78*	
Divorce rate	.56*	
Death rate from liver disease	.56*	
Physician density	.03	-

\*Significant at the .05 level

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Table 5. GLM-LS Means Test for County Type and General, Neonatal, and Postneonatal Infant Mortality Rates--Analysis of South Dakota Counties.

С	Туре	General IMR LS Mean	Prob >I/J	(T) 1	LS Mean (I) 2	LS Mean (J) 3
1 2 3	25% + 6.7 to 24.99 less than 6.7%	23.8790 9.5437 8.7012	1 2 3	0.0000 0.0077 0.0001	0.0000 0.8373	0.0000
с	Туре	Neonatal IMR LS Mean	Prob >I/J	(T) 1	LS Mean (Ì) 2	LS Mean (J) 3
1 2 3	25% + 6.7 to 24.99 less than 6.7%	13.0191 5.6640 4.0309	1 2 3	0.0000 0.0573 0.0010	0.0000 0.5868	0.0000
c	Туре	Postneonatal IMR LS Mean	Prob >I/J	(T) 1	LS Mean (I) 2	LS Mean (J) 3
1 2 3	25% + 6.7 to 24.99 less than 6.7%	10.8599 3.8797 4.6703	1 2 3	0.0000 0.1101 0.0395	0.0000 0.8164	0.0000

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